

Service Instructions

for use by heating contractor

VIESSMANN

Vitocrossal 300

CT3 Series

Gas-fired condensing boiler

Heating input: 638 to 3361 MBH
187 to 985 kW



VITOCROSSAL 300



Vitocrossal 300, CT3 boiler
with Vitotronic control



Product may not be exactly as shown

IMPORTANT

Read and save these instructions for
future reference.

Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

■ Product documentation

Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

►For a listing of applicable literature, please see section entitled "Important Regulatory and Safety Requirements".



■ Licensed professional heating contractor

The installation, adjustment, service and maintenance of this equipment must be performed by a licensed professional heating contractor.

►Please see section entitled "Important Regulatory and Installation Requirements".



■ Contaminated air

Air contaminated by chemicals can cause by-products in the combustion process, which are poisonous to inhabitants and destructive to Viessmann equipment.

►For a listing of chemicals which cannot be stored in or near the boiler room, please see section entitled "Mechanical Room" in this manual.



■ Advice to owner

Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shutdown procedure, and the need for professional service annually before the heating season begins.

■ Warranty

Information contained in this and related product documentation must be read and followed. Failure to do so renders the warranty null and void.



■ Carbon monoxide

Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas.

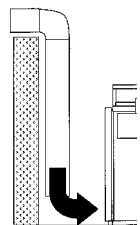
►For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see section entitled "Combustion air supply" and "Venting information" in this manual.



■ Fresh air

This equipment requires fresh air for safe operation and must be installed ensuring provisions for adequate combustion and ventilation air exist.

►For information pertaining to the fresh air requirements of this product, please see subsection entitled "Mechanical Room" in this manual.



■ Equipment venting

Never operate boiler without an installed venting system. An improper venting system can cause carbon monoxide poisoning.

►For information pertaining to venting and chimney requirements, please see section entitled "Venting Information" in this manual. All products of combustion must be safely vented to the outdoors.



! WARNING

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow the Viessmann maintenance schedule of the boiler in the "Service Instructions" manual.

Safety, Installation and Warranty Requirements *(continued)*

■ Fiberglass wool and ceramic fiber materials



WARNING

Inhaling of fiberglass wool and/or ceramic fiber materials is a possible cancer hazard. These materials can also cause respiratory, skin and eye irritation.

The state of California has listed the airborne fibers of these materials as a possible cancer hazard through inhalation. When handling these materials, special care must be applied.

Suppliers of ceramic fiber products recommend the following first aid measures:

- *Respiratory tract (nose and throat) irritation:*
If respiratory tract irritation develops, move the person to a dust free location.
- *Eye irritation:* If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes.
- *Skin irritation:* If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.
- *Gastrointestinal irritation:* If gastrointestinal tract irritation develops, move the person to a dust free environment.

Suppliers of fiberglass wool products recommend the following precautions be taken when handling these materials:

Precautionary measures

- Avoid breathing fiberglass dust and contact with skin and eyes.
- Use NIOSH approved dust/mist respirator.
- Wear long-sleeved, loose fitting clothing, gloves and eye protection.
- Wash work clothes separately from other clothing. Rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out and spraying may generate airborne fiber concentration requiring additional protection.

First aid measures

- If eye contact occurs, flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- If skin contact occurs, wash affected areas gently with soap and warm water after handling.

■ Hazardous materials



WARNING

Appliance materials of construction, products of combustion and the fuel contain alumina, silica, heavy metals, carbon monoxide, nitrogen oxides, aldehydes and/or other toxic or harmful substances which can cause serious injury or loss of life and which are known to the State of California to cause cancer, birth defects and other reproductive harm. Always use proper safety clothing, respirators and equipment when servicing or working nearby the appliance.

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Important Regulatory and Safety Requirements

Instructing the system user

The installer of the system is responsible to ensure the system operator/ultimate owner is made familiar with the functioning of the system, its activation, and its shut-down.

Note: The following topics must be covered:

Proper system operation sequence.

Explain the equipment as well as the need for combustion air.

Demonstrate an emergency shut-down, what to do and what not.

Explain that there is no substitute for proper maintenance to help ensure safe operation.

Initial start-up

Initial start-up must be performed by a qualified heating contractor. Completion of the Maintenance Record by the heating contractor is also required.

Note: The Maintenance Record is located on page 30 of this manual.

Working on the equipment

The installation, adjustment, service, and maintenance of this boiler must be performed by a licensed professional heating contractor who is qualified and experienced in the installation, service, and maintenance of hot water boilers. There are no user serviceable parts on the boiler, burners, or control.

Note: Please carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed.

For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

Viessmann offers frequent installation and service seminars to familiarize our partners with our products. Please inquire.

Ensure main power supply to equipment, the heating system, and all external controls has been deactivated. Close main gas supply valve. Take precautions in all instances to avoid accidental activation of power during service work.

Note: The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. This includes low water cut-offs, flow switches (if used), staging controls, pumps, motorized valves, air vents, thermostats, etc.

Technical literature

Literature for the Vitocrossal 300 CT3 boiler:

- Technical Data Manual
- Installation Instructions
- Service Instructions
- Operating Instructions and User's Information Manual

Note: Leave all literature at the installation site and advise the system operator/ultimate owner where the literature can be found. Contact Viessmann for additional copies.

Additional applicable literature:

- Viessmann boiler controls manuals

About these Instructions



Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.



WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in loss of life, serious injury or substantial product/property damage.

► Warnings draw your attention to the presence of potential hazards or important product information.



CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

► Cautions draw your attention to the presence of potential hazards or important product information.

IMPORTANT

► Helpful hints for installation, operation or maintenance which pertain to the product.



► This symbol indicates that additional, pertinent information is to be found.



► This symbol indicates that other instructions must be referenced.

Necessary Tools

Tools

- Assortment of flathead and Phillips screwdrivers
- Pipe wrenches
- Open-ended wrenches
- Pipe sealant
- Assortment of Allen keys
- Flashlight
- Approved leak detection fluid for natural gas and propane gas

Cleaning supplies

- Hand brush
- Cleaning/service brush (supplied)
- Vacuum cleaner
- Rags

Testing/Analysis equipment

(use only calibrated equipment)

- Flue gas analyzer to measure % CO₂ or O₂ (i.e. Bacharach fluid samplers or a suitable electronic analyzer)
- Multimeter to measure 0 - 120 VAC, 0 - 20 amps AC, and 0 - 20 microamps DC
- Pressure gage to measure gas pressure 0 - 28 "w.c. (a non-electric Magnehelic® pressure gage may also be used)
- Carbon monoxide measuring equipment (0 - 400 ppm)
- Bacharach calculator or suitable tables to calculate efficiency
- Stack thermometer 0 to 250° F (0 to 121° C)
- 1/8 in. NPT male to 1/4 in. barb adaptor fitting, as well as tubing for pressure measurement

Technical information

The following is a list of literature applicable to the Vitocrossal 300, CT3 boiler:

- Installation Instructions
- Service Instructions
- Operating Instructions and User's Information Manual

For installation of the heating system, please refer also to the technical literature of other System Technology devices:

- Installation Instructions for Viessmann boiler control
- Installation Instructions for Viessmann indirect-fired hot water storage tank(s)
- Installation Instructions for burner and accessories

Replacement parts

The materials listed below are recommended to be on hand for all service calls.

For a complete listing of replacement components, please see Parts List starting on page 24 of these instructions.

Order replacement components from your Viessmann distributor.



CAUTION

Use only original Viessmann components when replacing defective parts. Installation of incorrect replacement parts can cause hazardous operation and will void warranty.

Customer Site Information

Please complete the information below.

Site	
Name:	
Street:	
City:	
Tel.:	

Boiler	
Mfr.:	Viessmann
Series:	
Heating Input:	MBH
Serial No.:	

Burner	
Mfr.:	
Series:	
Heating Input:	MBH
Serial No.:	

Installing Contractor	
Firm:	
Technician:	
Address:	
Tel.:	
Installed on:	

Product Information

High efficiency gas-fired hot water condensing boiler.

For operation with modulating boiler water temperatures in closed loop, forced circulation hot water heating systems.

The Vitocrossal 300, CT3 boilers are CSA certified with Weishaupt and Riello burners which must be used in conjunction with this boiler series.

The proper burner size must be verified and the burner must be adjusted so that the maximum input of the appropriate boiler size is always observed and adjusted. The gas burner must always be installed according to the instructions provided by the burner manufacturer.

The boiler model selected should be based on an accurate heat loss calculation of the building. The boiler selected must be compatible with the connected radiation.

The Vitocrossal 300 boiler is suitable for a maximum operating pressure of 30 psig and a maximum boiler water temperature of 210° F (99° C).

The maximum hydrostatic test pressure is 45 psig.



WARNING

Exposing the boiler to pressures and temperatures in excess of those listed will result in damages, and will render warranty null and void.



See Installation and Operating Instructions for Vitotronic controls.

The Vitocrossal 300 boiler series is operated with a Vitotronic control and microcomputer indoor/outdoor control system for boiler operation without low temperature limit. The control system must be programmed for this type of operation.

This boiler does not require a flow switch.

This boiler is for natural gas or propane gas only.

Shut Down Heating System

1. Deactivate main power supply to heating system and secure against accidental reactivation.



WARNING

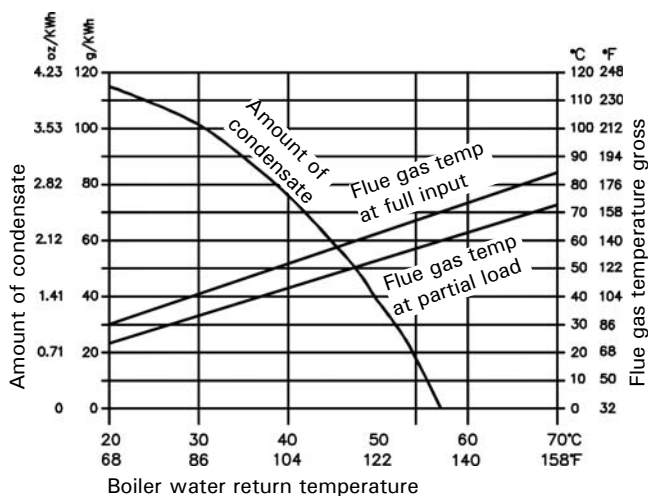
There may be more than one electrical disconnect.

2. Disconnect 41 plug from burner (where applicable).
3. Close main gas supply valve.

Check Pressure Relief Rating

The maximum allowable working pressure is 30 psig.

Dispose of Condensate



During the operation of the Vitocrossal 300 boiler, the amount of condensate as per the diagram can be expected. The values given are approximate amounts occurring under practical conditions. Not included in the chart is the amount of condensate occurring in the vent pipe and chimney system.

The condensate from the chimney system can be collected together with the condensate from the heating boiler and be disposed of into a floor drain.

The condensate occurring will have between 3 and 4 on the pH scale. If local building requirements demand neutralizing the condensate before disposal, contact Viessmann Manufacturing Company Inc. for a correctly sized neutralization tank. The treated condensate will show pH values of between 6.5 and 9 and can then be disposed of into the waste water system.

Note: The "amount of condensate" and the "flue gas temperature gross" graphs are independent of each other.

Check Flue Gas Damper



CAUTION

The flue gas damper is adjusted at the time of start-up commissioning.
Do not readjust. Any readjustments require confirmation of flue gas analysis.



For handling the damper, see section on pulsating noises on page 13.

Check Venting Connection

The flue gases contain a large amount of condensate. The condensate pH value is usually between 3 and 4. The flue gas temperatures depending on the boiler return water temperature may be between 77° F and 257° F (25° C and 125° C).

It is the responsibility of the manufacturer of the chimney system or venting system that they must properly design the venting system as well as select proper materials.

If there are any questions in regards to the neutralization of the condensate and/or to the venting of this boiler series, contact your local Viessmann Sales Representative.

Start up Heating System



Reference operating instructions for control unit, burner and neutralization system. Also reference service instructions of control unit, as well as burner manufacturer's documentation.



CAUTION

The start-up must be performed by a qualified service mechanic.



CAUTION

Do not tamper with the unit or controls.

1. Check if all national and/or local rules and regulations have been adhered to on this installation.
Do not attempt to start the boiler if you smell gas. If you smell gas open windows and doors and call your gas supplier immediately from a neighbor's phone.
Do not touch any electrical switches.
Extinguish any open flame.
2. Check system for proper water fill (cold fill pressure). Make sure that the complete system is properly vented hydronically. If installed, adjust automatic feed valve for proper fill pressure. Never burn garbage or paper in the combustion chamber or leave combustible materials around the heating system.
3. Maximum allowable working pressure is 30 psig.
4. Check and ensure that all ventilation is free of obstructions and communicates freely into the mechanical room.
5. Check the gas supply pressure (0 - 10 psig).



See burner data for details.

6. Check whether the cleaning opening on the flue outlet is closed.
7. Review all gas piping, perform leak test and open manual gas valve.
8. Ensure that all sensors are properly connected to the Vitotronic control unit.
9. Switch ON the main power disconnect, the switch for the heating circuit pump and the burner control switch, in that order.



See burner manufacturer's operating instructions.

10. The start-up of the system will be automatically initiated by the Vitotronic control.
The gas burner should be calibrated immediately for maximum input and also for combustion results.
11. Once system water is heated, deactivate circulating pump/boiler and vent system of any remaining air within piping, radiation and boiler.

IMPORTANT

Observe boiler temperature. Reset fixed high limit if required.

12. Check for proper operation of all circulating pumps, mixing valves, thermostats, zone valves, and any additional operating control function.
13. Check adjustable high limit (AHL) aquastat on Vitotronic control by dialing it to a setting below the boiler water temperature. The gas burner must deactivate. Turning the dial back to a setting higher than the present boiler water temperature must result in reactivation of gas burner. To adjust the dial on the adjustable temperature high limit on the Vitotronic control refer to the Vitotronic instruction literature.
14. Cycle boiler on/off with the operating control to verify proper operation.

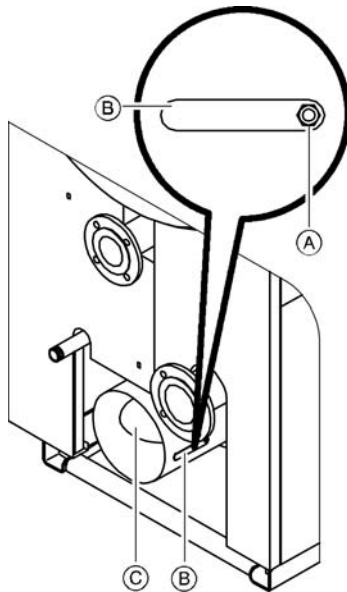
IMPORTANT

A system start-up report including a burner calibration report must be handed to the owner of the system.

15. Check the function of the neutralization unit (if installed).
16. Inspect all gaskets, unions and seals for tightness.

A few days after start-up, return and tighten bolts on combustion chamber door, as well as all clean-out and inspection openings on the boiler to ensure tightness.

Reduce Pulsation Noises



Gas-tight (positive pressure) flue systems may create pulsation noises, irrespective of the boiler, burner or flue gas system make. Pulsation noises may be reduced by rotating the damper fitted into the flue outlet (during start-up only).

1. Loosen M 10 nut (A) in lever (B) of damper (C).
2. Adjust the lever until all pulsating noises have ceased (the lever mirrors the damper position).
3. Lock the damper with the M 10 nut.
4. Readjustment of burner settings is required.

Open Combustion Chamber Door

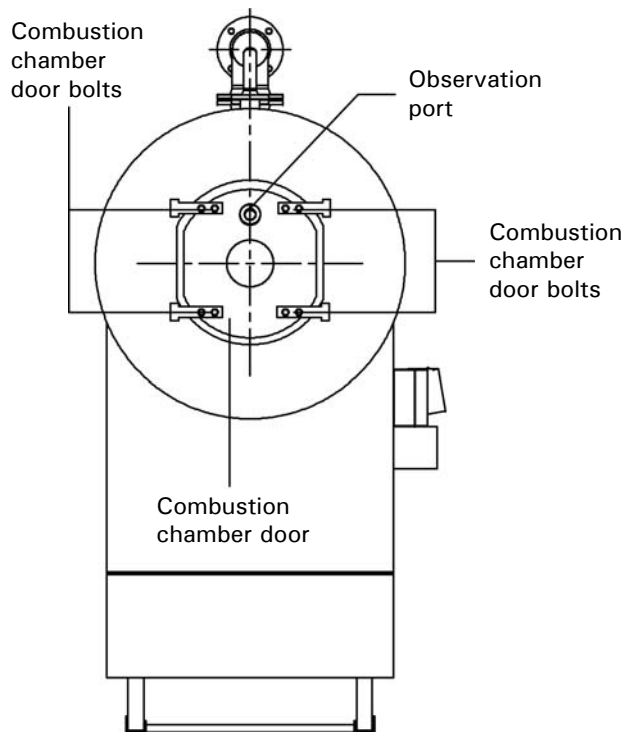


CAUTION

Do not put any tools or other objects into the combustion chamber.

1. Remove the gas supply pipe.
2. Loosen the screws on the boiler door and open it.

Clean Combustion Chamber and Heat Exchanger Surfaces



IMPORTANT

It is recommended to service, clean and inspect the heating system at least once a year. Viessmann recommends a service contract with a mechanical firm. Neglected service on the unit presents a risk, service and cleaning on a regular basis ensures that the unit will operate at its peak efficiency with minimal emissions over many years of operation.

IMPORTANT

Combustion residues coating the heat transfer surfaces may cause an increased flue gas temperature and therefore reduced efficiency. The flue gas temperature increases by 90° F (50° C) with each 1/25 in. (1 mm) accumulation.

1. Ensure main power supply to equipment, the heating system, and all external controls has been deactivated. Take precautions in both instances to avoid accidental activation.
2. Close all gas valves.
3. Allow boiler to cool if necessary (boiler should be at room temperature).
4. Use a plastic covering to protect the burner door, burner, and gas controls from water spray.
5. Open observation cover plate on the front of the stainless steel flue gas collector located on the front of the boiler. The observation opening is accessed by first removing the bottom front enclosure panel.
6. Use a water hose to wash down stainless steel combustion chamber and Inox-Crossal water heating section (avoid water contact with rope material on boiler combustion chamber door). Do not allow any water to enter between pressure vessel and insulated enclosure.

IMPORTANT

Do not use any abrasive materials, such as wire brushes, to clean stainless steel combustion chamber.

Use only soft nylon brushes or clean rags to wipe down combustion chamber. Remove any loose debris.

7. Direct garden hose into the flue gas collector at the bottom of the boiler, washing any sediment from the combustion chamber down the condensate drain. Verify that all "P" traps on all condensate drain lines are clear, and that water flows freely without restriction or accumulation.



CAUTION

The cleaning agent used must not contain any solvents based on hydro-carbons.

Clean Combustion Chamber and Heat Exchanger Surfaces *(continued)*

CAUTION

Ensure that no cleaning agent is entering between the pressure vessel and the insulation enclosure.

8. With a good light source (flash light, trouble light) examine combustion chamber and flue gas collector area for discoloration of the stainless steel. If discoloration exists, an acid wash is recommended. The recommended phosphoric acid-based cleaner is Antox 73 E Plus. The recommended citric acid-based cleaner is CitriSurft 3050 by Stellar Solutions Inc. These cleaners are available at most welding supply stores. Do not use any other chemical cleaner.

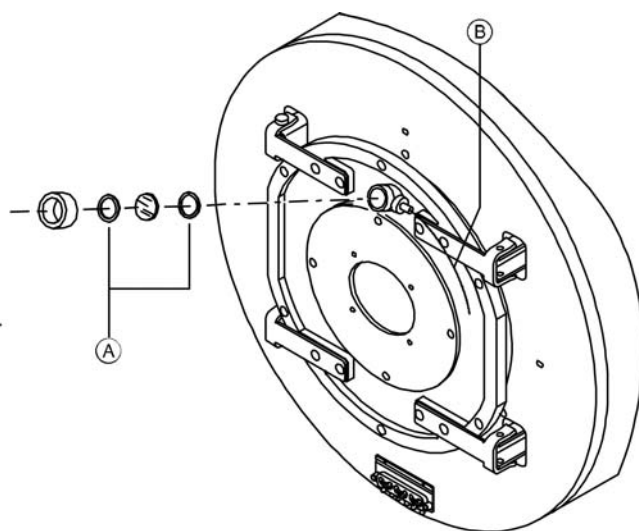


WARNING

Follow cleaning agent instructions.
Wear protective clothing/gloves as well as eyewear.

9. Lightly spray the cleaning agent onto the discolored areas. Allow acid wash to work on stainless steel surfaces for approx. 15 - 20 minutes, then rewash combustion chamber with water. Repeat if necessary. Observe detailed instructions supplied with cleaning agent.
10. Resecure observation cover plate on the front of the flue gas collector.
11. Resecure combustion chamber door to boiler.
Complete a gas leak test and verify proper operation of all components.

Clean Observation Port in Combustion Chamber Door

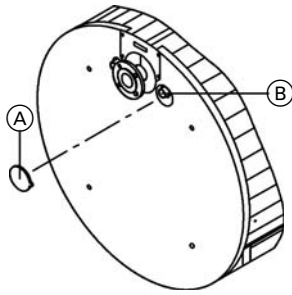


Check gaskets (A) and hose connection (B) for leaks.

IMPORTANT

Do not over tighten to avoid leaks and potential damage.

Check all Connections and Sensor Well for Leaks



CAUTION

Only open the heating water connections after the boiler has been depressurized. Only drain the boiler with a vacuum pump when the boiler air vent valve is open.

1. Remove cap (A) from the back of the boiler.
2. Check sensor well (B) for leaks.
3. Reinstall cap.

Check Proper Operation of Low Water Cut-off



Observe the detailed test instructions by the manufacturer.

Check Proper Expansion Tank and System Pressures



CAUTION

Carry out all check in accordance with the expansion tank manufacturer's instructions. Limit pressure fluctuations to the lowest possible differential. Cyclical pressure fluctuations and greater pressure differentials indicate a system fault. Immediately remedy such faults, otherwise other heating system components may become faulty.



Reference expansion tank manufacturer's instructions.

IMPORTANT

The diaphragm expansion tank must be able to hold the heating water expansion volume inside the boiler, and must be properly sized for the system.

This diaphragm expansion vessel reduces the frequency and severity of pressure fluctuations; the service life of the circulating pump is improved and therefore the operational reliability and service life of system components increased.



CAUTION

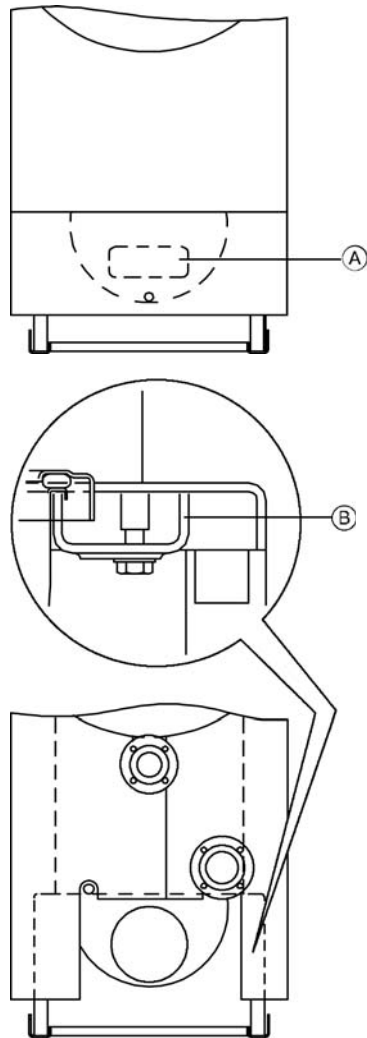
Damage on boiler or other system components may result if these recommendations are not followed.

IMPORTANT

Carry out this test on a cold system.

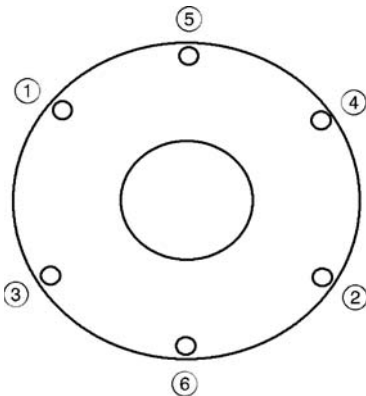
1. Drain system or close cap valve on the diaphragm expansion tank and reduce the pressure until the pressure gage indicates "0".
2. Cold static 60° F (15.5° C) water fill pressure must equal diaphragm expansion tank pressure.

Check Flue Gas Collector for Leaks



1. Visually check the gasket through clean-out opening **A** on the flue gas collector. Traces of condensate on the outside of the flue gas collector indicate a leak.
2. If necessary, retighten the gaskets using clamping clips **B**.

Close Combustion Chamber Door



1. Tighten the screws on the boiler door evenly and diagonally. See drawing on the left for tightening sequence.
2. Install the gas supply pipe.



CAUTION

Check all gas connections for tightness.

Check Thermal Insulation

Check thermal insulation fit and adjust if necessary.

Check Viessmann Mixing Service Valve for Proper Operation and Leaks

1. Remove the motorized lever from the mixing valve handle.
2. Check mixing valve for ease of operation.
3. Check mixing valve for leaks.
Replace the O-rings if the mixing valve leaks.
4. Snap the motorized lever back into place.

Adjust Burner

The input of the burner used with the Vitocrossal 300 boiler must be adjusted so that the maximum boiler input of the particular boiler model is not exceeded.

The burner must also be adjusted for proper combustion results. CO₂ values between 9 and 10% are possible.



Follow manufacturer's instructions supplied with burner.

Check Separate Heating System Controls

In case additional controls are installed in the boiler room, e.g. control aquastats, mixing valves, controls etc., please observe their respective operating instructions.

Check for Proper DHW Production

The Vitocrossal 300 boiler may be used to supply domestic hot water heating by means of an indirect-fired hot water storage tank. The appropriate connections to the boiler must be made, as well as the correct size circulating pump must be used. The control circuit to provide domestic hot water is already provided within the Vitotronic control (motor contactor may be required in some instances). Please contact your local Viessmann Sales Representative for details.

Maintenance Schedule

The following is an overview of scheduled service steps.

Regular service work ensures reliable, energy-efficient, and environmentally friendly operation.

IMPORTANT

Keep boiler and boiler room clear and free from combustible materials, gasoline and other flammable vapors and liquids. Do not obstruct the flow of combustion and ventilation air. All inspection, maintenance, and service must be performed by a qualified heating contractor.

IMPORTANT

The boiler must be cleaned at least once a year by a qualified heating contractor or service agency.

Frequency	Performed by	✓	Service
Monthly	Owner / Operator		Check the system pressure frequently.
			Ensure proper operation of the boiler control. Refer to operating instructions of control.
			Inspect all seals; retighten or replace as necessary.
			Ensure an adequate supply of combustion air and ventilation air into and out of the mechanical room is being maintained at all times.
			Ensure that nothing is obstructing the flow of combustion - ventilation air, and no chemicals, garbage, gasoline, combustible materials, flammable vapors, or liquids are stored, not even temporarily, in the vicinity of the boiler.
			Check for water on the floor from the discharge pipe of pressure relief valve or any other pipe, pipe joint, valve, or air vent.
			Test pressure relief valve and check for proper operation. See instructions attached to pressure relief valve.
			Check all operational high limits for proper operation.
			Check for proper operation of the condensate neutralization system (if used).
			Check the condition and fill status of the neutralization media.
			Check the pH value of the flue gas condensate (min. 6.5).
			Check for moisture water on external vent pipe joints and appearance of ice on the vent pipe or chimney outlet in the winter time.

Maintenance Schedule *(continued)*

Frequency	Performed by	✓	Service
Annually	Owner / Operator		Ensure service work/test is conducted at least annually by qualified personnel, and that any deficiencies are corrected immediately.
	Heating Contractor		Test functionality of safety high limits.
			Test burner with burner accessories according to their corresponding maintenance checklist.
			Test and establish proper chemical makeup of system water.
			Check flue pipe condition, chimney connection and chimney itself.
			Check pressure relief valve and system pressure, and verify proper operation.
			Check heating pipe joints, valves, air vents, etc. System leaks must be corrected immediately to avoid further defects. The cause of defect must also be determined in order to avoid further problems.
			Check for proper combustion air supply and ventilation to boiler / mechanical room.
			Test high limits by dialing lower settings, switching burner on/off to verify functioning of same. Test low water cut-off, check and verify proper function according to manufacturer's instructions.
			When circulating pump is field-installed or existing, check requirements for maintenance or lubrication according to manufacturer's specifications.
			Check for gas-tight connection of gas piping, unions, gas valve and manifold.
			Check proper ignition on oil or gas burner operation.
			Combustion test must be performed by a qualified heating contractor.
Periodically	Heating Contractor		Ensure functionality of low water cut-offs, including flushing of float types (if used) during operation, based on supplier's instructions.
			Inspect low- and/or high pressure gas switch (if used).
			Inspect main burner flame and follow burner manufacturer's instruction manual for detailed service and maintenance guidelines. Manual shipped with burner.
			All boilers and the boiler room must be kept free of high dust levels, high humidity, aggressive vapors and/or chemicals containing chlorine.
			Ensure proper boiler room ventilation.
			Valves, fittings and pipes not pressure tight must be repaired.
			Combustion chamber door, clean-out opening covers, and flanges may need to be retightened and resealed. Do not over tighten.

Danger of Freezing

If the system is subject to freezing temperatures and is not filled with antifreeze for protection, the system including the boiler must be drained of water. The valve before automatic feed valve (if installed) must be closed. All other valves, air vents and drain valves must remain open.

Long Periods of Shut-down

In case the heating boiler is shut down for an extended period of time, i.e. after the heating season, the combustion chamber, the flue gas collector and the vent pipe should be properly cleaned to avoid corrosion. The heating system can stay filled and under pressure. The remaining condensate should be removed from the flue gas collector by means of the front inspection service opening.

Water Quality

The lifetime of the entire heating system is influenced by the water quality. A water treatment system will protect against damages caused by corrosion and lime formation. Hard water conditions (i.e. calcium carbonate) must be avoided as it will cause deposits to accumulate on the heat exchanger surfaces.

If in any doubt about the water quality, please have a proper water analysis done. Check with regional chemical suppliers for boiler water treatment or with Viessmann Manufacturing Company Inc. directly.

Technical Data

Boiler Model	CT3-	17	22	28	37	46	57	72	89
Input	MBH (kW)	638 (187)	846 (248)	1071 (314)	1389 (407)	1726 (506)	2160 (633)	2702 (792)	3361 (985)
Output*1	MBH (kW)	626 (183)	827 (242)	1044 (306)	1350 (396)	1675 (491)	2094 (614)	2616 (767)	3252 (953)
Combustion efficiency	%	98.3	97.8	97.4	97.2	97.1	96.9	96.8	96.7
Thermal efficiency	%	98.1	97.7	97.4	97.2	97.1	96.9	96.8	96.7
Boiler output at 176/140° F (80/60° C)	MBH (kW)	554 (162.3)	734 (215.3)	930 (272.6)	1206 (353.3)	1502 (440.2)	1879 (550.7)	2351 (689.0)	2924 (857.0)
158/122° F (70/50° C)	MBH (kW)	576 (168.7)	763 (223.7)	966 (283.2)	1253 (367.1)	1561 (457.4)	1953 (572.2)	2443 (716.0)	3038 (890.4)
104/86° F (40/30° C)	MBH (kW)	607 (177.8)	805 (235.8)	1019 (298.6)	1321 (387.1)	1645 (482.2)	2059 (603.2)	2575 (754.8)	3203 (938.7)
Boiler standby loss at maximum input 176/140° F (80/60° C)	Btu/h	2566	2818	3064	3583	4299	5240	5753	6633
	W	752	826	898	1050	1260	1536	1686	1944
	%	0.40	0.33	0.29	0.26	0.25	0.24	0.21	0.20
158/122° F (70/50° C)	Btu/h	2139	2347	2552	3047	3583	4367	4794	5753
	W	627	688	748	893	1050	1280	1405	1686
	%	0.34	0.28	0.24	0.22	0.21	0.20	0.18	0.17
104/86° F (40/30° C)	Btu/h	856	938	1020	1143	1433	1747	1918	2211
	W	251	275	299	335	420	512	562	648
	%	0.13	0.11	0.10	0.08	0.08	0.08	0.07	0.07
Dimensions - boiler as shipped	in.	59¾	62¾	66	69	72¼	78¼	82¼	90
Length (door removed)	(mm)	(1516)	(1594)	(1675)	(1751)	(1829)	(1985)	(2095)	(2289)
Width 1 (max. shell width)	in.	27	27	27	31½	31½	31¼	37½	37½
	(mm)	(684)	(684)	(684)	(800)	(800)	(800)	(951)	(951)
Height*2 (max.)	in.	697/8	71⅞	71¼	79⅝	79⅝	79⅝	88	88
	(mm)	(1773)	(1808)	(1811)	(2023)	(2023)	(2023)	(2235)	(2235)
Overall dimensions	in.	64¼	67½	70½	73½	76¾	83	85½	93¼
Overall length	(mm)	(1636)	(1714)	(1795)	(1871)	(1949)	(2105)	(2172)	(2366)
Overall width	in.	40	40	40	44½	44½	44½	49	49
(incl. insulation and control)	(mm)	(1016)	(1016)	(1016)	(1132)	(1132)	(1132)	(1249)	(1249)
Overall height	in.	797/8	81⅞	81¼	935/16	935/16	935/16	101¾	101¾
(to top of installed header)	(mm)	(2027)	(2062)	(2065)	(2370)	(2370)	(2370)	(2585)	(2585)
Width (upper with jacketing)	in.	34½	34½	34½	39	39	39	45⅞	45⅞
	(mm)	(874)	(874)	(874)	(990)	(990)	(990)	(1147)	(1147)
Width (lower with jacketing)	in.	31½	31½	31½	36	36	36	39	39
	(mm)	(798)	(798)	(798)	(914)	(914)	(914)	(990)	(990)
Boiler support frame	in.	35¼	38⅜	41½	47¼	50	56¼	56¼	64⅞
Length	(mm)	(895)	(975)	(1055)	(1200)	(1270)	(1430)	(1430)	(1630)
Width	in.	27¼	27¼	27¼	32½	32½	32½	35½	35½
	(mm)	(690)	(690)	(690)	(800)	(800)	(800)	(900)	(900)
Height	in.	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾
	(mm)	(70)	(70)	(70)	(70)	(70)	(70)	(70)	(70)

*1 Tested to AHRI BTS-2000 "method to determine efficiency of commercial space heating boilers".

*2 Boilers CT3-17, 22, 28 are shipped with header attached (u) - see overall height dimensions and add 4 in. (100 mm) for the wood blocks as per transportation height.

Technical Data *(continued)*

Boiler Model	CT3-	17	22	28	37	46	57	72	89
Weight	lbs	1012	1114	1202	1671	1759	1995	2706	3014
boiler shell	(kg)	(459)	(505)	(545)	(758)	(798)	(905)	(1230)	(1370)
front cone (includes combustion chamber door)	lbs	413	413	413	490	490	490	600	600
	(kg)	(187)	(187)	(187)	(222)	(222)	(222)	(273)	(273)
Overall weight complete with insul. and control (less burner)	lbs	1228	1352	1455	1962	2064	2322	3014	3344
	(kg)	(557)	(613)	(660)	(890)	(936)	(1053)	(1370)	(1520)
Boiler water content	USG	71.3	78.2	87.2	129.5	140.8	150.6	199.2	221.9
	(L)	(270)	(296)	(330)	(490)	(533)	(570)	(754)	(840)
Heat exchanger surface	ft. ²	85.0	107.6	123.8	176.5	200.2	245.4	316.5	383.2
water-cooled	(m ²)	(7.9)	(10.0)	(11.5)	(16.4)	(18.6)	(22.8)	(29.4)	(35.6)
Max. operating temperature	°F	210							
	(°C)	(99)							
Max. operating pressure	psig	30							
	kpa	(207)							
Flue gas resistance	"w.c.	0.40	0.56	0.64	0.80	0.88	1.08	1.20	1.32
	Pa	(100)	(140)	(160)	(200)	(220)	(270)	(300)	(330)
Boiler connections	in.	2½	2½	3	4	4	4	5	5
boiler supply (BS) & return (BR1)	(mm)	(65)	(65)	(80)	(100)	(100)	(100)	(125)	(125)
Boiler return (BR2)* ³	in.	2	2	2	3	3	3	4	4
	(mm)	(50)	(50)	(50)	(75)	(75)	(75)	(100)	(100)
Safety supply	in.	1¼	1¼	2	2	2	2	2½	2½
	(mm)	(32)	(32)	(51)	(50)	(50)	(50)	(65)	(65)
Boiler drain	in.	1	1	1	1	1	1	1	1
Condensate drain	in.	½	½	½	½	½	½	½	½
Vent pipe	in.	8	8	8	10	10	10	12	12
internal Ø	(mm)	(201)	(201)	(201)	(251)	(251)	(251)	(301)	(301)
Flue gas values * ⁴	°F	113	113	113	113	113	113	113	113
	(°C)	(45)	(45)	(45)	(45)	(45)	(45)	(45)	(45)
Temperature (at a return temperature of 86° F (30° C) - at rated input									
- at partial load	°F	104	104	104	104	104	104	104	104
	(°C)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)
Temperature (at a return temperature of 140° F (60° C)	°F	167	167	167	167	167	167	167	167
	(°C)	(75)	(75)	(75)	(75)	(75)	(75)	(75)	(75)
Mass flow rate (of flue gas)	lbs/h	704	928	1179	1531	1903	2380	2979	3705
	(kg/h)	(320)	(422)	(536)	(696)	(865)	(1082)	(1354)	(1684)
Gas volume of combustion chamber and heat exchanger	ft. ³	8.83	9.92	12.00	15.90	18.40	21.54	40.61	42.73
	(m ³)	(0.250)	(0.281)	(0.340)	(0.450)	(0.521)	(0.610)	(1.150)	(1.210)
Pressure at boiler flue outlet	Pa	±0	-3	±0	-5	±0	±0	±0	±0
- at partial input									
- at maximum input	Pa	-3	-4	-2	±0	±0	±0	±0	±0

*³ Boiler has two return connections - the heating return with the lower temperature should be connected to the boiler return BR1.

*⁴ Values for calculating the size of the flue system based on 10% CO₂ for natural gas. Flue gas temperatures measured as gross values at 68° F (20° C) combustion air temperature. The details for partial load refer to an output of 30% of rated input. Calculate the flue gas mass flow rate accordingly when the partial load differs from that stated above (subject to the burner mode).

► For information regarding other Viessmann System Technology componentry, please reference documentation of respective product.

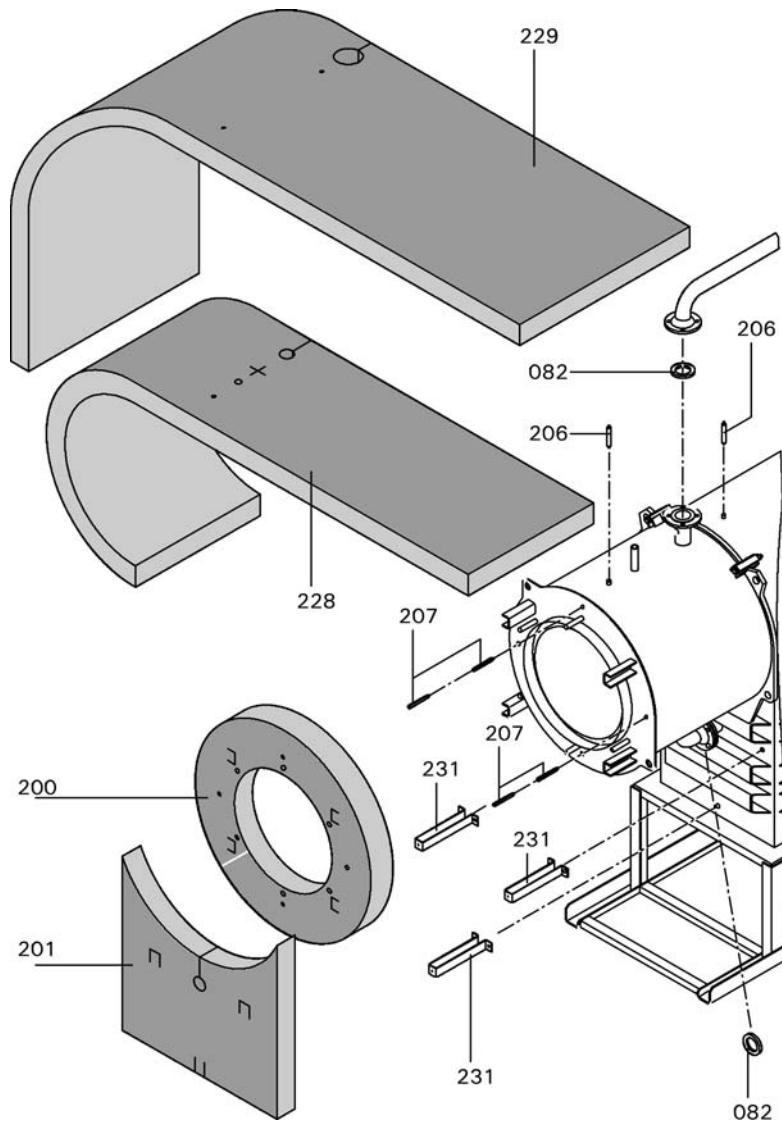
Parts List

When ordering replacement parts

Please provide boiler Model and Serial Number from rating plate when ordering replacement parts.
Order replacement parts from your Viessmann distributor.

Parts

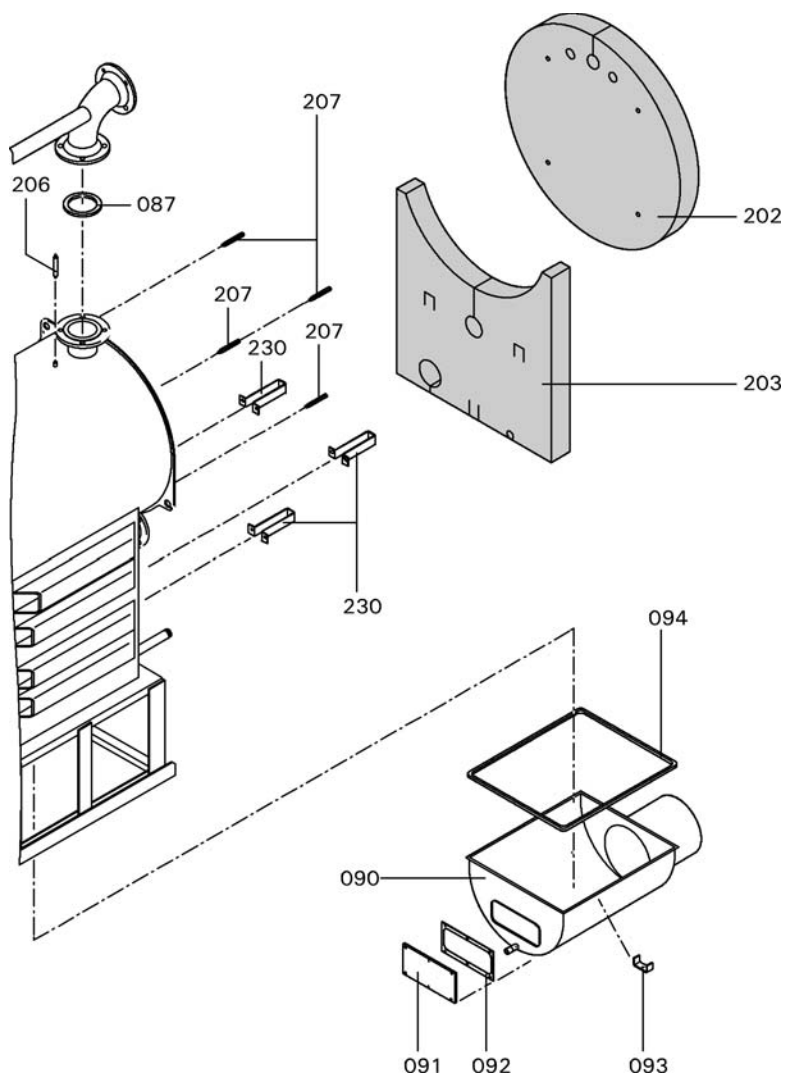
- 082 Gasket, PN6
- 200 Insulation blanket-front, top
- 201 Insulation blanket-front, bottom
- 206 Spacer bolt, top
- 207 Spacer bolt, front/rear
- 228 Insulation blanket-front
- 229 Insulation blanket-rear
- 231 Mounting bracket, front



Parts List *(continued)*

Parts

- 087 Gasket, PN6
- 090 Condensate pan (with items 091, 092 and 094)
- 091 Cover for condensate pan
- 092 Cleanout gasket (order with 304 sealant)
- 093 Retaining clip
- 094 Condensate pan gasket (order with 405 sealant)
- 202 Insulation blanket-rear, top
- 203 Insulation blanket-rear, bottom
- 206 Spacer bolt, top
- 207 Spacer bolt, front/rear
- 230 Mounting bracket, rear

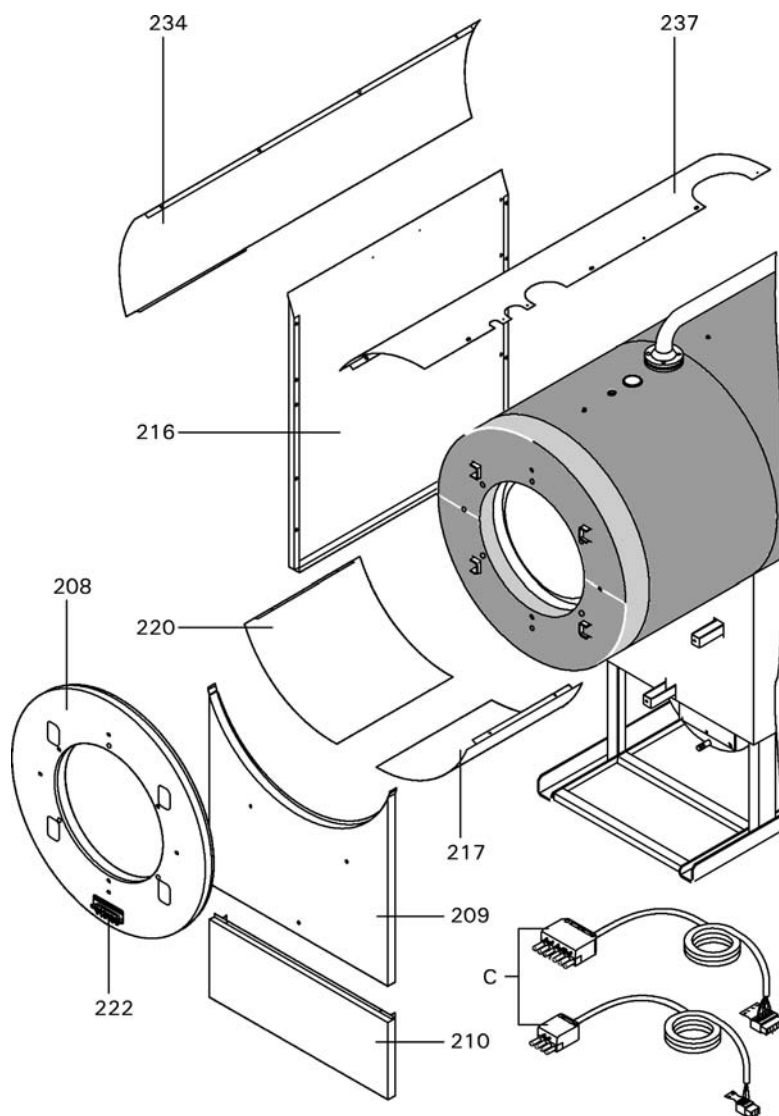


Parts List *(continued)*

Parts

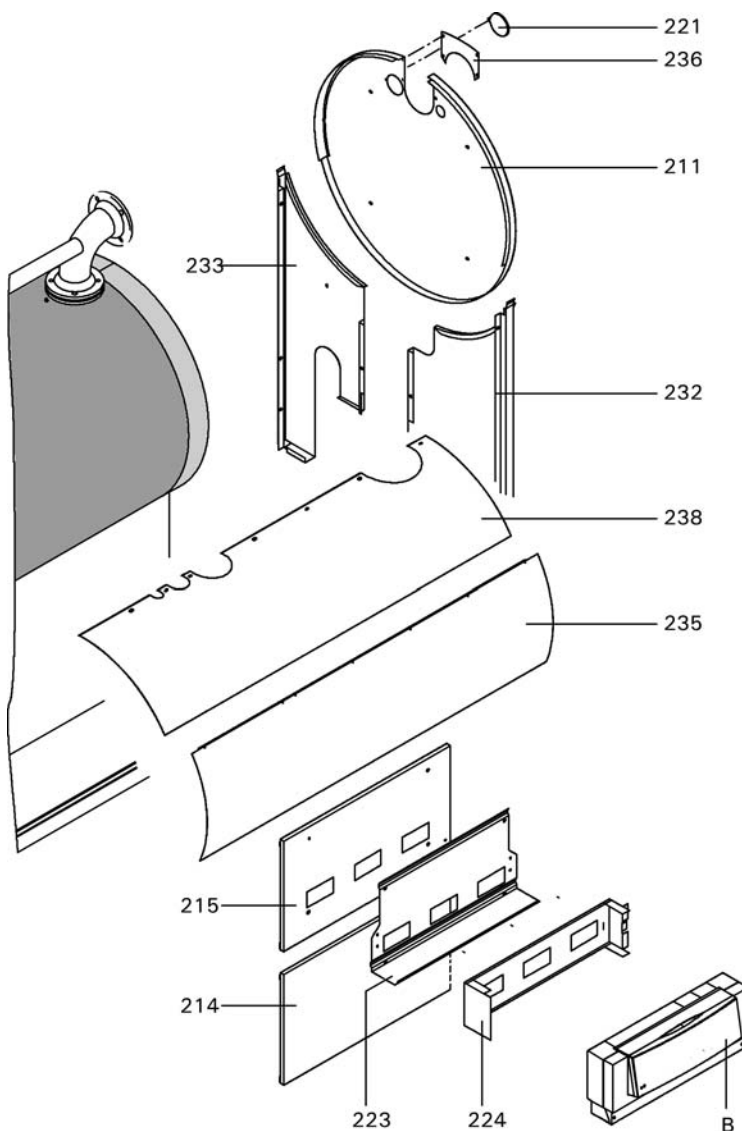
- 208 Front panel, top
- 209 Front panel, middle
- 210 Front panel, bottom
- 216 Side panel (left/right)
- 217 Lamellar panel-bottom right
- 220 Lamellar panel-bottom left
- 222 Strain relief (6-channel)
- 234 Lamellar panel-center left
- 237 Lamellar panel-top left\

- © Burner cable
(may not be exactly as illustrated)



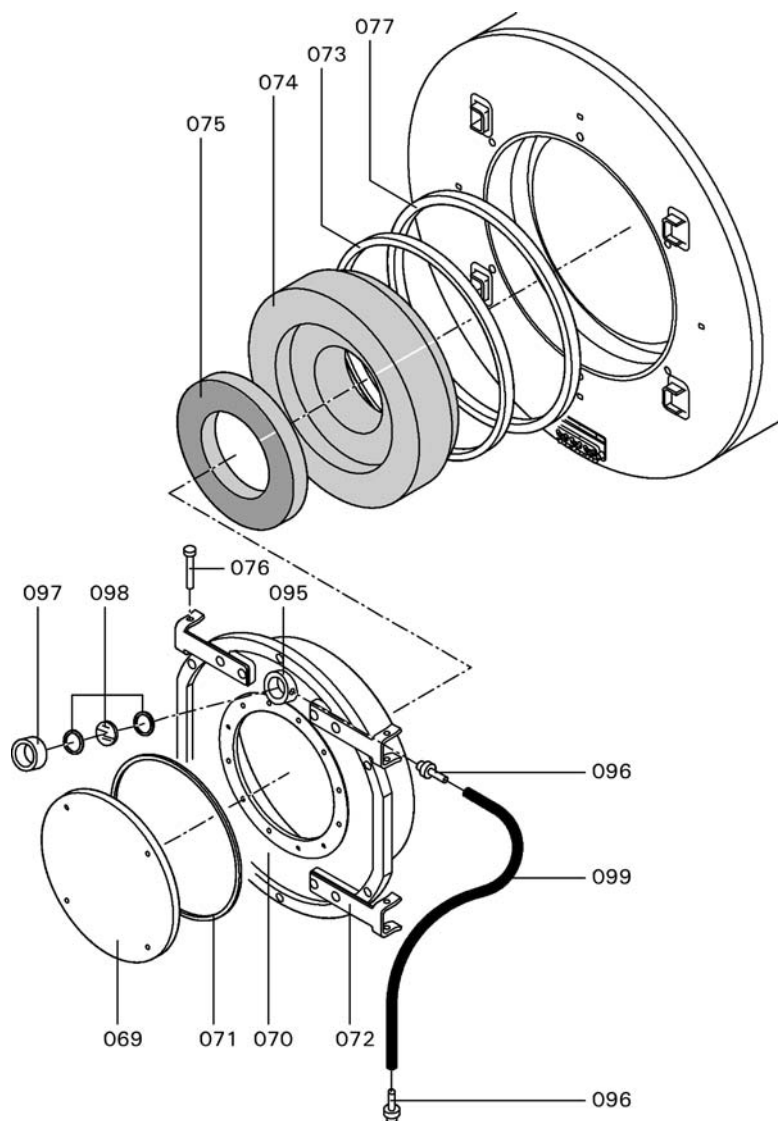
Parts List *(continued)***Parts**

- 211 Rear panel, top
- 214 Side panel, bottom
- 215 Side panel, top
- 221 Cover, round access
- 223 Console casing-rear
- 224 Console case-front
- 232 Rear panel, right
- 233 Rear panel, left
- 235 Lamellar panel-center right
- 236 Cover plate
- 238 Lamellar panel-top right
- Ⓑ Boiler control
(see separate parts list)



Parts List *(continued)***Parts**

- 069 Burner plate
- 070 Combustion chamber door
- 071 Glass fiber gasket 9 x 7 x l=2000 mm
- 072 Support bracket (hinges)
- 073 Glass fiber gasket 20 x 15 x l=2000 mm
- 074 Combustion chamber door refractory
- (order with 304 sealant)
- 075 Insulation blanket
- 076 Pin
- 077 Glass fiber gasket 30 x 20 x l=2000 mm
- 095 Sight glass (glass, cap, nipple, gasket)
- 096 Hose nipple 1/4 in.
- 097 Sight glass cap
- 098 Sight glass with gaskets
- 099 Plastic hose, 800 mm



Parts List *(continued)*

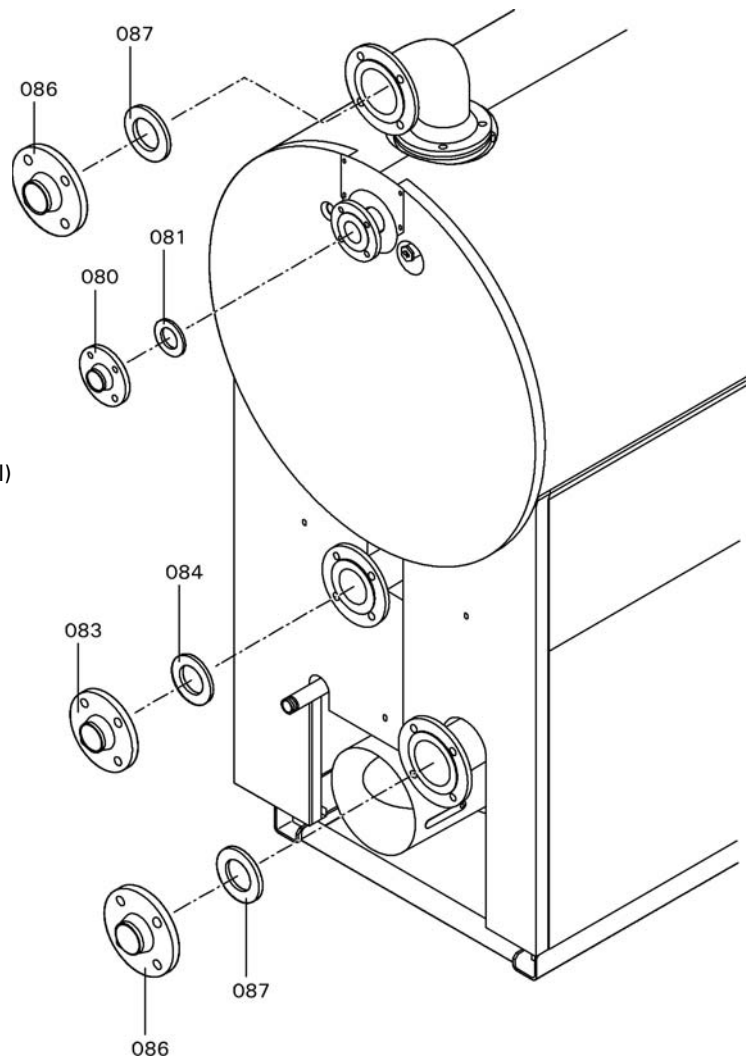
Parts

- 080 Counter flange
- 081 Gasket, PN6
- 083 Counter flange
- 084 Gasket, PN6
- 086 Counter flange
- 087 Gasket, PN6

Other parts (not illustrated)

- 300 Access. pack (insulation)
- 301 Installation Instructions
- 302 Service Instructions
- 303 Access. pack (leveling bolts)
- 304 Dirko sealing compound HT, 90 g
- 305 Accessory pack (door bolts, set of 4)
- 306 Insulation, burner blast tube
- 307 Dirko sealing compound HT (tube 310 ml)
- 308 Parts List
- 400 Safety header
- 401 Air vent with shut-off base
- 402 Low water cutoff model 550 with manual reset
- 403 Pressure gage, 0-60 psi
- 404 Pressure relief valve, 30 psig
- 405 Terostat-MS 9360 (tube 310 ml)

- Ⓐ Rating plate (a 16-digit bar-coded serial no. is printed on the Viessmann rating plate)



Maintenance Record

	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service
on:					
by:					
	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service
on:					
by:					
	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service
on:					
by:					
	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service
on:					
by:					
	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service
on:					
by:					
	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service	Maintenance/ Service
on:					
by:					

Quick Reference

°C	°F
-40	-40
-35	-31
-25	-13
-20	-4
-18	0
-16	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
0	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+86
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

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